

StaneO

User manual VIBRATO

VIBRATO-ManuelUtilisateur-en

Introduction

Vibrato is an integrated seismological observatory. It is composed of a geophone measuring the ground velocity and a small computer designed for signal processing and data preparation.

The geophone is the small cylinder located in the upper right angle of the box.

The computer includes a screen where the real time signal is continuously displayed. The internal software provides the following functions :

- continuously recording the signal at 50 samples per second (sps);
- build the daily plots;
- automatic and manual selection of data segments;
- data preparation and dissemination.

Two connectors are present on the box:

- the power socket (12VDC);
- RJ45 socket for the network connexion to the LAN.

Delivery

The system includes:

- Vibrato;
- power adapter (220VAC/12VDC)
- network cable (RJ45);
- this user manual.

Installation

Vibrato is designed to be wall-mounted using 4 screws. A bearing wall is perfect. The box must be located so that no cable (power or network) is taut.

The transparent cover must be removed to access the holes for the screws.

The geophone must be vertical.

Configuration

The following parameters can be defined:

- name and location of the station
- network settings.

The left button located on the board is used to enter setup mode :



A credit card can be used to press the button:



In setup mode, Vibrato has always the same IP address : 192.168.0.111. Using a web browser on a computer connected to the RJ45 socket, Vibrato can be reached using <http://192.168.0.111>. Vibrato presents a web interface that must be used for all the setup tasks. **Do not use the screen, the parameters will not be saved.**

The computer used to setup the station must be connected directly to the RJ45 socket, the IP address of the computer must be in the same subnetwork as Vibrato in setup mode. Using 192.168.0.110 is perfect.

The setup page is in french only.

Configuration de la station Vibrato :

Nom court (4 ou 5 caractères en majuscules de A à Z, sans espaces) :

Description du site (texte libre) :

Nom affiché par la station :

Localisation de la station, en degrés décimaux, positifs vers leNord et l'Est avec un point (.) comme séparateur décimal. Par exemple pour Bordeaux : latitude=44.83, longitude=-0.59

Latitude :

Longitude :

Configuration de l'interface réseau de Vibrato :

Tous les champs sont au format numérique a.b.c.d, par exemple 192.168.0.1, sans espace. Cependant, pour attribuer automatiquement une adresse à l'interface, saisissez *dhcp* dans le champ *adresse*. Les autres champs seront ignorés.

Adresse (par exemple 192.168.0.10 ou *dhcp*) :

Masque de sous réseau (par exemple 255.255.255.0) :

Sous réseau (par exemple 192.168.0.0) :

Passerelle (par exemple 192.168.0.1) :

Serveur de nom principal (par exemple 192.168.0.1) :

Serveur de nom secondaire (par exemple 8.8.8.8) :

(enregistrer les modifications et redémarrer Vibrato)

Field “Nom court” is the short name of the station : 5 capital letters (A-Z). Please check that no other station uses the name you intend to define.

Field “Description du site” is free.

The button “Vérifier” allows to check that the name in the last field is correct when displayed by the interface (check “Nom affiché par la station” after pressing “vérifier”).

The station location (fields “Latitude” and “Longitude”) is used to place the station on the map and to automatically select the interesting earthquakes. These fields must be given in decimal degrees. Two digits after the decimal dot provide an acceptable accuracy for the map and the earthquake

selection.

Network setup:

“Adresse” if the IP address used by the station (e.g. 192.168.0.12).

“Masque de sous réseau” is the subnet mask (e.g. 255.255.255.0).

“Passerelle” is the gateway (e.g. 192.168.0.1).

“Serveur de nom principal” is the main name server (e.g. 8.8.8.8).

“Serveur de nom secondaire” is the backup name server (e.g. 4.4.4.4).

All the above fields must be given in numerical form: aaa.bbb.ccc.ddd. Contact the network administrator to define the correct network parameters.

Vibrato can also determine the network settings using dhcp. To use dhcp, enter the magic word “dhcp” in “Adresse”, “Masque de sous réseau”, and “Passerelle” fields. The “Serveur de nom” fields must be defined in any case. You may decide to use some free public name server such as 8.8.8.8 or 4.4.4.4.

Finally, press “Envoyer” to send and save the new parameters. Do not forget to connect the Vibrato station to the LAN.

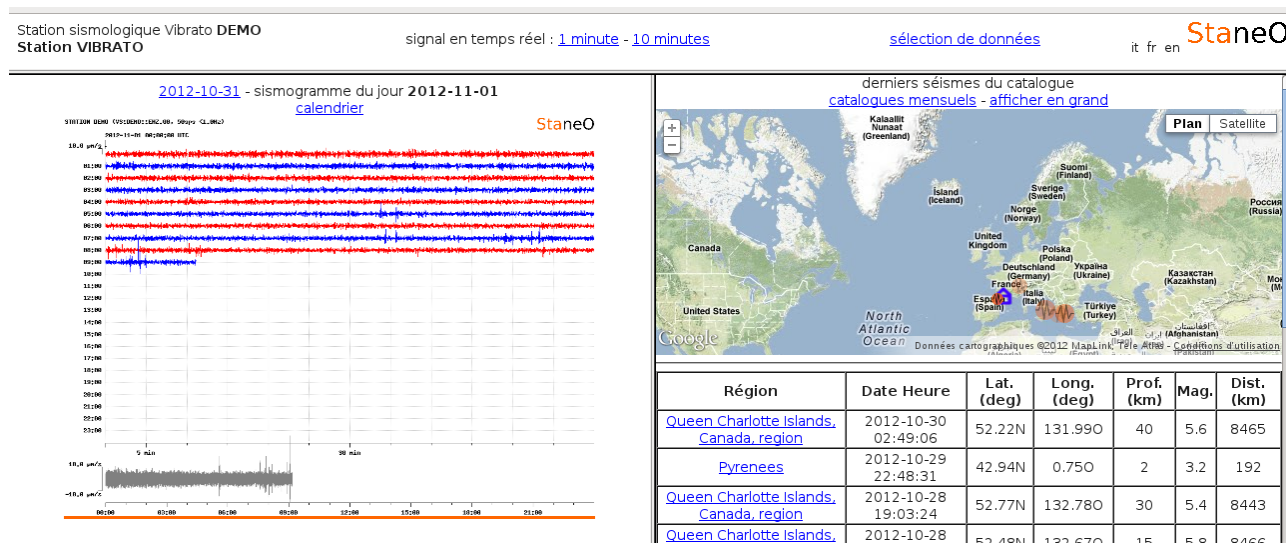
Startup

When powering the Vibrato station, the screen first displays the system boot image (Ångström). Then the screen becomes black until the network connection with vibrato.staneo.fr is established and the station time is set (using ntp). Then, the seismogram appears.

The green LED located on the small board in the upper right corner must blink once per second. It is not the green LED at the bottom of the large board. If it does not blink, unplug the power socket and restart.

The red LED located on the small board in the upper right corner must blink when the box moves (gently knock the box to check), again, this LED is not the red LED located at the bottom of the large board.

Data access



The integrated interface can be connected locally (from the LAN) using the IP address displayed on the screen integrated screen, e.g. <http://192.168.0.10>. This address is the one entered in the setup interface or the address configured by the DHCP server.

The integrated interface presents two large panels. The left one displays the daily plots, the right one presents a map with the automatically selected earthquakes. On the top of the page, the real time signal can be displayed using a java applet (integrated) in a 1 or 10 minutes window. Any data segment can also be selected and extracted from the internal data.

Viewing the signal in real time and viewing MiniSEED files is based on java technology. Your computer must be able to run java applets. The applet used is SeisGram (check <http://alomax.free.fr/seisgram/SeisGram2K.html> for details).

The signal displayed using the applet or on the plots generated by Vibrato are displayed as velocity, most of the time in $\mu\text{m/s}$ or nm/s , sometimes in mm/s for very large velocities.

Seismograms are time stamped using the “Internet time” (NTP). The accuracy is about 0,01s but depending of the network stability, it can be higher (about 0,1s).

Automatic data transfer

The data (earthquakes and daily plots) are automatically transferred on the central Vibrato server (vibrato.staneo.fr). This server also provides the earthquake list to all the Vibrato stations.

Network connectivity

Vibrato uses the following network ports:

- ntp (UDP/123) outgoing, to several ntp servers (including 0.europe.pool.ntp.org, 1.europe.pool.ntp.org etc.);
- http (TCP/80) outgoing, for the data transfer and earthquakes list;
- http (TCP/80) incoming, for any direct connection to the integrated interface.

These two protocols are mandatory for the station to work as expected. Eventually, SEEDLink port (TCP/18000, incoming) is used to connect the real time data server.

Trouble shooting

- ✗ Everything is OK up to the black screen, thas remains black forever.
 - It probably means that the network connectivity is not sufficient.
First check the network cables (check the LEDs close to the RJ45 socket).
Also check the network settings, the firewall setup: is the station allowed to connect vibrato.staneo.fr on port TCP/80 ? is the station allowed to get the network time using port UDP/123 ?
- ✗ At startup, the screen presents a seismogram that is never updated, the green LED in the upper right corner is not blinking).
 - Unplug/plug the power socket.

Technical data

- Weight: 1kg
- Dimensions (mm):130x180x60
- Power supply: 12V, 2A
- Network connection: ethernet RJ45
- Integrated display: 480x272
- Internal memory for data: 4Go (more than 30days, continuous data and earthquakes)
- Minimal outgoing connectivity: NTP (UDP/123)
- Optimal outgoing connectivity (all features) : NTP (UDP/123), HTTP (TCP/80)
- Integrated DHCP client
- Automatic data upload: <http://vibrato.staneo.fr>
- Data access: HTTP, SEEDLink
- Data format: 24bits MiniSEED, Steim-1 compressed
- Time accuracy: NTP ($\pm 0,01s$)
- Geophone : 4,5Hz
- Band: 20s-20Hz
- Constant: 0,42nm/s/unit
- Sampling rate: 50sps

Theoretical transfer function

